BASS20

Powered Subwoofer

SERVICE MANUAL

JBL Consumer Products Inc.
80 Crossways Park West
Woodbury, N.Y. 11797
1-800-336-4JBL in the USA

A Harman International Company

Part No.: 1112-JBLBASS20

TABLE OF CONTENTS

SPECIFICATIONS

Amplifier Power (RMS)	150 Watts
Low Frequency Woofer (2)	8 1/2"
Design	Bass reflex enclosure, Grey or White
Inputs	Line Level and Speaker Level
Outputs	Full Range Speaker
Crossover Frequency	120Hz
Frequency Response	40Hz - 120Hz (+/-3dB)
External Dimensions (Inches)	
Height	17-3/4"
Width	10"
Depth	24"
External Dimensions (mms)	
Height	451
Width	254
Depth	610
Weight	42lbs (19.1kg)

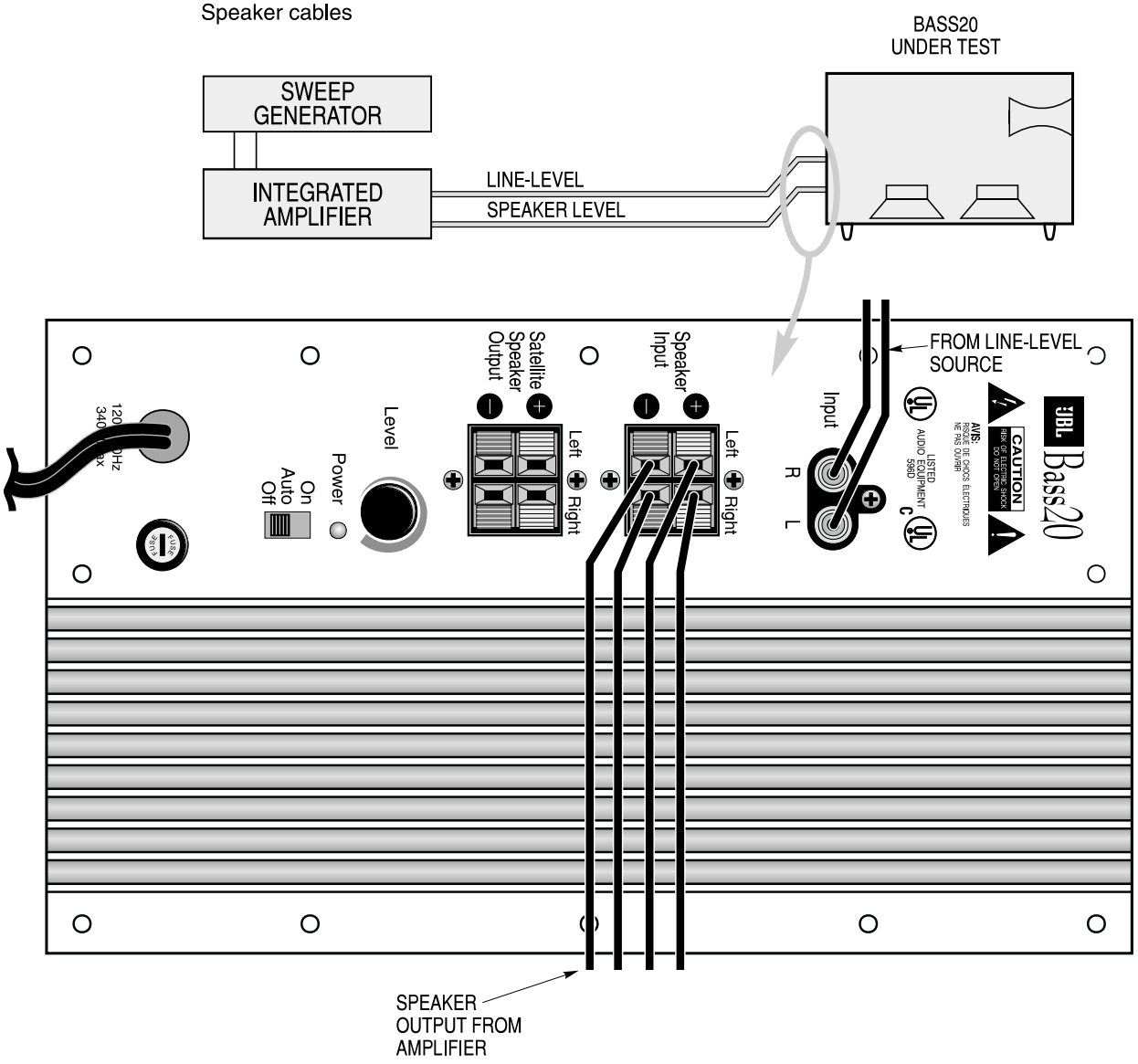
FEATURES

- The Bass20 powered subwoofer is part of the SCS120 or MUSIC 20 System.
- 150 watt output.
- Variable level control.
- Line level or Speaker level inputs, outputs for full range satellite speakers.
- User friendly “auto on” circuit. Signal sensing automatically turns the subwoofer on so you don’t have to; the subwoofer is meant to be left “on” without continual use of the power switch.

BASS 20 POWERED SUB WOOFER TEST SETUP

EQUIPMENT

Function generator/signal generator/sweep generator
Integrated Amplifier
Multimeter
Speaker cables



JBL continually strives to improve its products. New materials, production methods and design refinements are introduced into existing models without notice as a routine expression of our design philosophy. For this reason, Bass Series loudspeakers may differ in some respect from their published specifications and descriptions, but will always equal or exceed the original specifications unless otherwise stated.

TEST PROCEDURE

Equipment Needed:

- Function generator/signal generator/sweep generator
- Integrated Amplifier
- Multimeter
- Cables - Line level (RCA) and Speaker cables

UUT = Unit Under Test

General Function

1. Connect both left and right line level inputs (RCA) to signal generator and UUT. Use Y-cable if necessary from mono source.
2. Turn on generator and adjust to **100mV, 50 Hz.**
3. Plug in UUT; red LED should be ON. Turn power switch to the ON or AUTO position and turn LEVEL control full clockwise.
4. Green LED should light, immediate bass response should be heard and felt from port tube openings.
5. Turn off generator, turn unit to OFF, disconnect RCA cables.
6. Connect two pairs of speaker cables to high level input terminal on UUT. Cables should be connected to an integrated amplifier fed by the signal generator. **Observe polarity of speaker cables.**
7. Turn on generator and adjust so that speaker level output is **2.5V, 50 Hz**.
8. Turn power switch to the ON or AUTO position and turn LEVEL control full clockwise.
9. Green LED should light, immediate bass response should be heard and felt from port tube opening.

Sweep Function

1. Follow steps 1-4 above, using a sweep generator as a signal source.
2. Sweep generator from **20Hz to 300Hz**. Listen to the cabinet and drivers for any rattles, clicks, buzzes or any other noises. If any noises are heard, remove driver and test.

Driver Function

1. Remove one or both drivers from cabinet; remove + and - wire clips.
2. Check DC resistance of driver; it should be **4.2** ohms.
3. Connect a pair of speaker cables to driver terminals. Cables should be connected to an integrated amplifier fed by a signal generator. Turn on generator and adjust so that speaker level output is **5.0V**.
4. Sweep generator from **20Hz to 1kHz**. Listen to driver for any rubbing, buzzing or other unusual noises.

SERVICE NOTE (120v Version only)

Even though the Bass20 seems to have an on/off power switch, in fact the switch does not switch the main power off to the amp assembly, even in the OFF position. All AC and DC voltages within the amplifier are still active, so for safety concerns the AC power cord should be unplugged before any servicing begins.

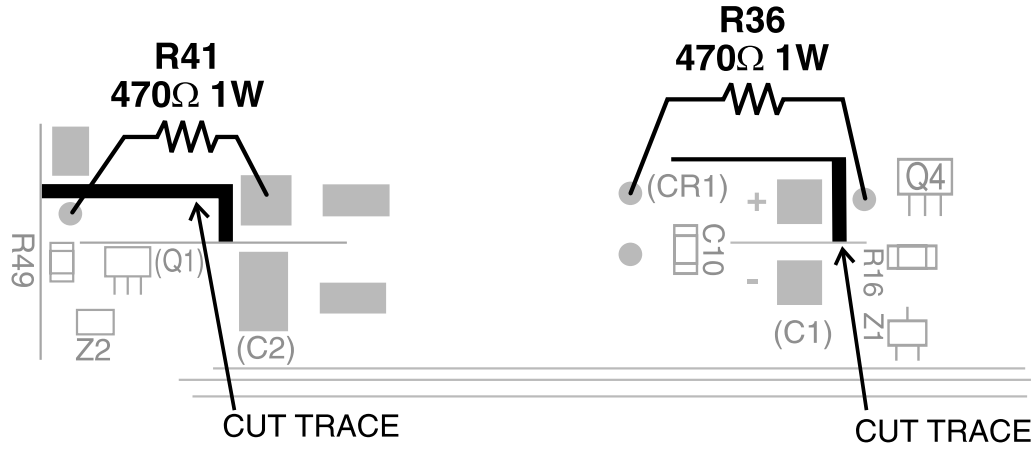
IMPORTANT SERVICE NOTE:

Amplifier assemblies with serial numbers less than 11757 should be modified for safe operation. Examine amplifier as follows (serial #11756 or lower) to determine if a factory modification has taken place:

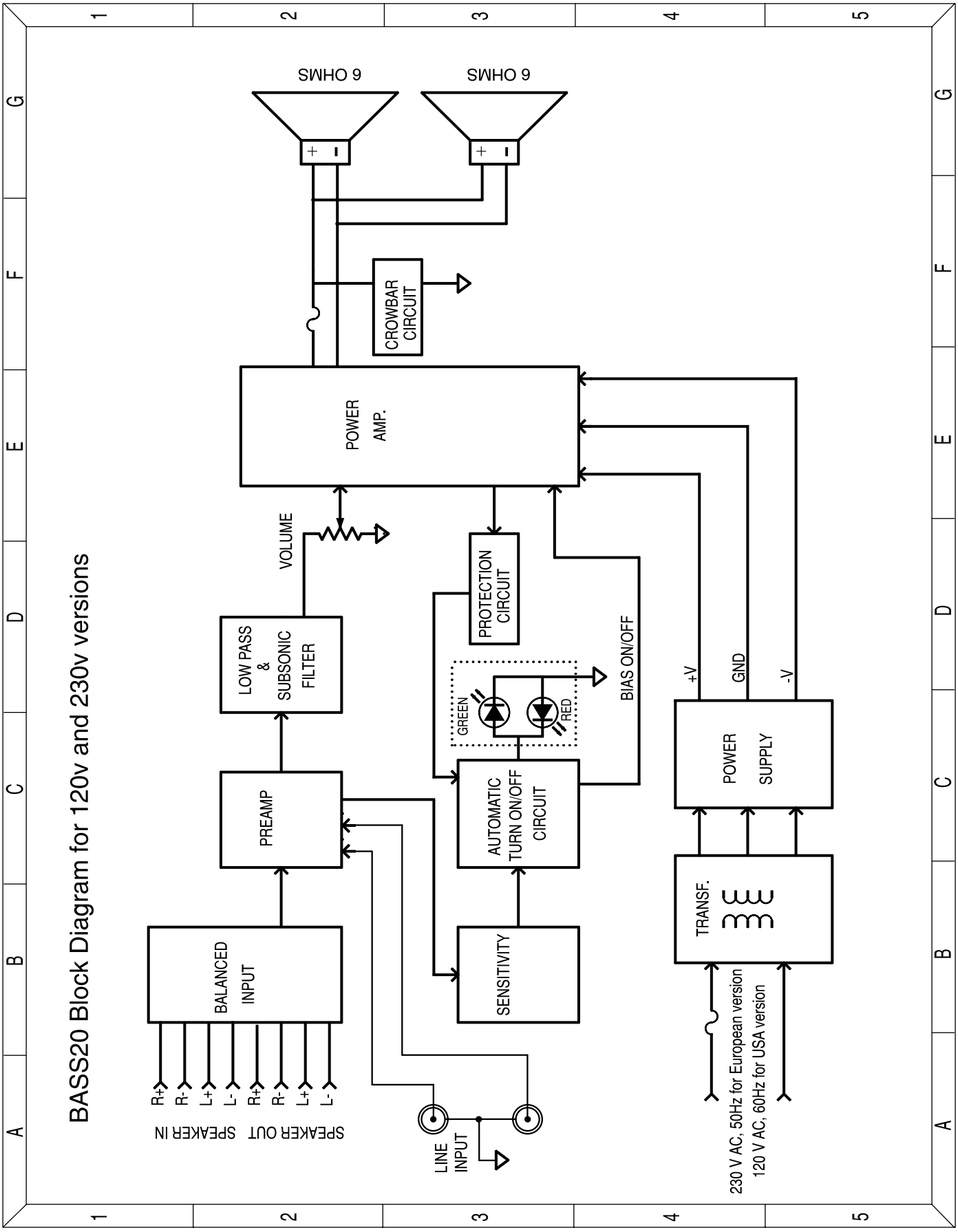
1. Unplug and remove amp assembly; (12) #8 x 3/4" screws.
2. Lift and examine the main (large) amp board, solder (green) side of the board.
3. Look for the presence of two large resistors (1k, 3 Watt or 470 ohm, 1Watt) directly underneath the two large filter caps on the opposite side of the board.
4. If these resistors are present, the unit has been modified.
5. If they are missing, the unit should be modified before future use, regardless of what the initial service concern was. To continue without modification may result in a hazardous condition.

MODIFICATION:

1. Cut tie wraps to bundled wire assemblies for easier access. Circuit board does not have to be removed from heatsink.
2. R36: See drawing: cut trace connecting Q4 collector and main C1 (+) pad.
3. Create solderable surface on PCB, (on Q4 side of cut) by scraping the green mask from board with Exacto knife or similar tool.
4. Attach R36, 470 1W resistor (JBL #RS2180) to new surface and cathode side of CR1. Resistor should "stand off" from PCB; secure with RTV or epoxy if desired.
5. R41: See drawing; cut trace connecting Q1 collector and main C2 (-) pad.
6. Create solderable surface on PCB, (just above R49) by scaping the green mask from the board with Exacto knife or similar tool.
7. Attach R41, 470W 1W resistor (JBL #RS2180) to new surface and C1 (-) pad. Resistor should "stand off" from PCB; secure with RTV or epoxy if desired.
8. Retie cables with tie wraps.
9. Cut and insert two in-line fuse holders (JBL #155020A) with 4A fuses (JBL #312004); one in each positive wire leading to woofer terminal, close to the amplifier assembly.
10. Replace amp assembly in cabinet.



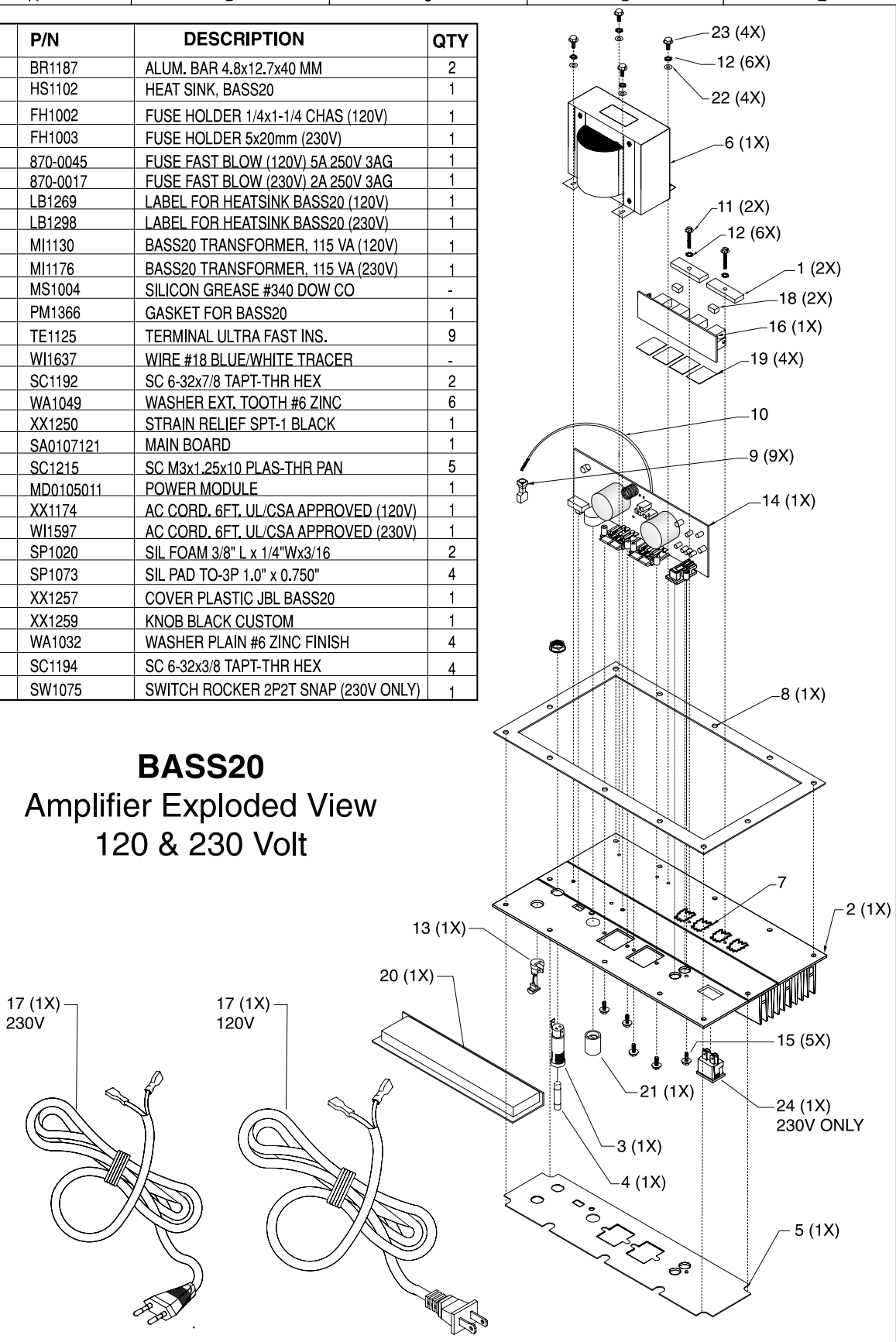
BASS 20 (120v US & 230v European Versions) BLOCK DIAGRAM



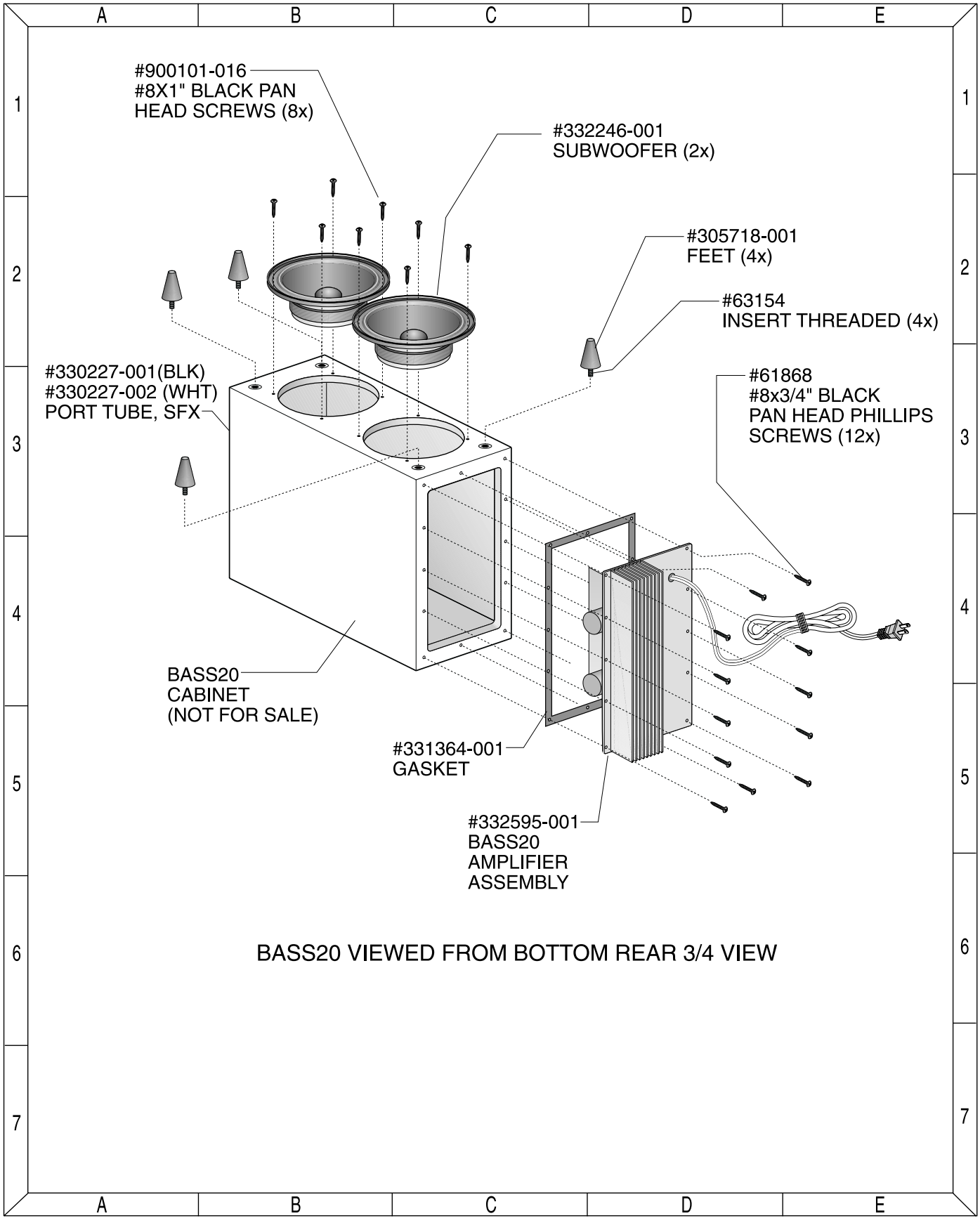
BASS20 (120V & 230V versions) AMPLIFIER EXPLODED VIEW

#	P/N	DESCRIPTION	QTY
1	BR1187	ALUM. BAR 4.8x12.7x40 MM	2
2	HS1102	HEAT SINK, BASS20	1
3	FH1002	FUSE HOLDER 1/4x1-1/4 CHAS (120V)	1
	FH1003	FUSE HOLDER 5x20mm (230V)	1
4	870-0045	FUSE FAST BLOW (120V) 5A 250V 3AG	1
	870-0017	FUSE FAST BLOW (230V) 2A 250V 3AG	1
5	LB1269	LABEL FOR HEATSINK BASS20 (120V)	1
	LB1298	LABEL FOR HEATSINK BASS20 (230V)	1
6	MI1130	BASS20 TRANSFORMER, 115 VA (120V)	1
	MI1176	BASS20 TRANSFORMER, 115 VA (230V)	1
7	MS1004	SILICON GREASE #340 DOW CO	-
8	PM1366	GASKET FOR BASS20	1
9	TE1125	TERMINAL ULTRA FAST INS.	9
10	WI1637	WIRE #18 BLUE/WHITE TRACER	-
11	SC1192	SC 6-32x7/8 TAPT-THR HEX	2
12	WA1049	WASHER EXT. TOOTH #6 ZINC	6
13	XX1250	STRAIN RELIEF SPT-1 BLACK	1
14	SA0107121	MAIN BOARD	1
15	SC1215	SC M3x1.25x10 PLAS-THR PAN	5
16	MD0105011	POWER MODULE	1
17	XX1174	AC CORD, 6FT, UL/CSA APPROVED (120V)	1
	WI1597	AC CORD, 6FT, UL/CSA APPROVED (230V)	1
18	SP1020	SIL FOAM 3/8" L x 1/4"Wx3/16	2
19	SP1073	SIL PAD TO-3P 1.0" x 0.750"	4
20	XX1257	COVER PLASTIC JBL BASS20	1
21	XX1259	KNOB BLACK CUSTOM	1
22	WA1032	WASHER PLAIN #6 ZINC FINISH	4
23	SC1194	SC 6-32x3/8 TAPT-THR HEX	4
24	SW1075	SWITCH ROCKER 2P2T SNAP (230V ONLY)	1

BASS20
Amplifier Exploded View
120 & 230 Volt



BASS20 CABINET ASSEMBLY EXPLODED VIEW



BASS20 VIEWED FROM BOTTOM REAR 3/4 VIEW

BASS 20 PARTS LIST

MECHANICAL PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	QTY
1	BR1187	ALUM. BAR 4.8mmx12.7mmx40m	2
	BR1387	ALUMINUM BAR 1.9"x0.5"x0.1	1
2	HS1102	HEAT SINK ASSY.	1
3	FH1002	FUSE HOLDER 1/4x1-1/4 (120V)	1
	FH1003	FUSE HOLDER 5x20mm (230V)	1
4	SEE FUSES		
5	LB1269	LABEL FOR HEATSINK (120V)	1
	LB1298	LABLE FOR HEATSINK (230V)	1
7	MS1004	SILICONE GREASE #340 DOW	
8	PM1366	GASKET FOR BASS20	1
9	TE1125	TERMINAL ULTRA FAST INS.	9
10	WI1637	WIRE #18 BLUE/WHITE TRACER	3"
11	SC1192	Sc 6-32x7/8 TAPT-THR HEX W	2
12	WA1049	WASHER EXT. TOOTH #6 ZINC	6
13	XX1250	STRAIN RELIEF SPT-1 BLACK	1
15	SC1215	SCREW M3x1.25x10 plas-Thr Pan	5
17	XX1174	AC CORD. 6FT UL/CSA APRO. (120V)	1
	WI1597	AC CORD. 6FT UL/CSA APRO. (230V)	1
18	SP1020	SIL. FOAM 3/8"Lx1/4"Wx3/16	2
19	SP1073	SIL PAD TO-3P 1.0"x0.75"	4
20	XX1257	COVER PLASTIC	1
21	XX1259	KNOB BLACK CUSTOM	1
22	WA1032	WASHER PLAIN #6 ZINC FINISH	4
23	SC1194	Sc 6-32x3/8 TAPT-THR HEX	4
	331364-001	GASKET	1
	61868	Sc #8x3/4" Blk Pan Head Phillips	12
	305718-001	FOOT	4
	63868	INSERT THREADED (for foot)	
	332246-001	SUBWOOFER	2
	900101-016	SCREW #8x1" Blk Pan Head	8
	C01076	RCA JACK DUAL GOLD RED/WHT	1
	C01256	JACK SPEAKER QUAD PC	2
CT, LINE 1 LINE 2	TE1175	TRMNL MALE TAB 0.32"x0.25" PI	3

ELECTRICAL PARTS LIST

Capacitors

C1, C2	CP1635	CAP ALUM EL 4700uF 20% 63v	2
C3, 20	CP1473	CAP CERAMIC 220 pF 50V P	2
C4, 24, 30 31, 32, 33	CP1415	CAP ALUM EL. 2.2uF 20% 50V P	6
C5	CP1439	SMD CAP 33nF 10% 100V X7R PI	1
C7	CP1633	CAP CERAMIC 0.033uF 5% 50 PI	1
C8, 10, 13	CP1552	SMD CAP 0.1uF 20% 100V Z5U P	3
C9, 12, 27, 29	CP1417	CAP ALUM EL. 22uF 20% 16V P	4
C11	CP1178	CAP POLY FILM 22nF 5% 63V P	1
C14, 16	CP1426	SMD CAP 0.1uF 20% 50V Z5U P	2
C15	CP1479	SMD CAP 3300pF 10% 100V X PI	1
C19, 28	CP1645	CAP AL EL 22uF 20% 63V 85 PI	2
C21	CP1478	SMD CAP 330pF 5% 100V NPO P	1
C22	CP1475	SMD CAP 33pF 5% 50V NPO 12 P	1
C23	CP1411	CAP ALUM EL. 100uF 20% 16V P	1
C1P	CP1426	SMD CAP 0.1uF 20% 50V Z5U P	1
C2P, C3P	CP1480	SMD CAP 470pF 5% 100V NPO	2
C4P	CP1552	SMD CAP 0.1uF 20% 100V Z5U P	1
C5P, 6, 17	CP1579	33µF 16V NPE	3
CX	CP1808	0.1µF 250V	1
CX1, CX2, CX3, CX4	CP1844	0.01µF 200V SMD	4

Diodes

CR1, 2, 3, 4	DI1005	1N5401 DIODE 3A/200V P	4
D1, 2, 3, 4, 5	DI1132	SMD DIODE 1N4148 LL-34 PKG T P	5
Z1, 2	DI1150	SMD ZENER 15V 5% CP PKG T P	2

Fuses

F1 (120V)	870-0052	FUSE Fast Blow 5A 250V 3AG	1
F1 (230V)	870-0017	FUSE Fast Blow 2A 250V 3AG	1
F2	FS1073	FAST BLOW 8A 250V ACG (early versions)	1
F2	312004	FAST BLOW 4A 250V ACG (later versions)	2

Integrated Circuits

IC1, 2, 3, 4, 5	IC1041	IC SMD DUAL J-FET NJM072B OP AMP	5

Resistors

J1, 2, 3, 4, 5, 6, 7, 10	RS1779	SMD RES ZERO Ω JUMPER 12 P	8
P1	RS1794	POT, 50KΩ 20% LOG TAPER	1
R1, 2, 4, 5, 24, 42, 57, 58	RS1702	SMD RES 100KΩ 5% 1/8W 12 P	8
R3, 8, 14, 18 21, 23, 27, 32, 38, 39, 45, 50, 52, 53, 54	RS1701	SMD RES 10KΩ 5% 1/8W 120 P	15
R6, 7, 31, 48	RS1700	SMD RES 1KΩ 5% 1/8W 12 P	4
R9, 10	RS1720	SMD RES 200KΩ 1% 1/8W 1 PI	2
R11	RS1872	SMD RES 51KΩ 5% 1/8W 120 P	1
R12	RS2101	SMD RES 24KΩ 5% 1/8W 120 PI	1
R13, 15	RS1704	SMD RES 22KΩ 5% 1/8W 120 P	2
R16, 49	RS1715	SMD RES 5.6KΩ 5% 1/8W 1 P	2
R17	RS1883	SMD RES 1.5KΩ 5% 1/8W 12 P	1
R19	RS1878	SMD RES 10Ω 5% 1/8W 120 P	1
R20, 40	RS1829	SMD RES 160Ω 5% 1/8W 12 P	2
R22, 33, 34	RS1705	SMD RES 4.7KΩ 5% 1/8W 12 P	3
R25	RS1831	SMD RES 7.5KΩ 5% 1/8W T/ P	1

REF. NO.	PART NO.	DESCRIPTION	QTY
R26, 28	RS1717	SMD RES 100Ω 5% 1/8W 12 P	2
R29	RS1716	SMD RES 33.2K 1% 1/8W 120 P	1
R30	RS1711	SMD RES 220Ω 5% 1/8W 12 P	1
R35	RS1912	SMD RES 11KΩ 5% 1/8W 120 P	1
R36, 41	RS2180	470W 1W (early versions: 1K 1W)	2
R37	RS1703	SMD RES 2.2KΩ 5% 1/8W 12 P	1
R43, 44	RS1968	SMD RES 2.2MΩ 5% 1/8W 12 P	2
R47, 55	RS1767	SMD RES 1 MΩ 5% 1/8W 120 P	2
R51	RS1793	SMD RES 475K 1% 1/8W 12 P	1
R56	RS1722	SMD RES 470Ω 5% 1/8W 12 P	1
R1P, 1AP, 2P 2AP	RS1868	RES. W/W 0.1Ω 5% 5W RAD P	4
R3P, R7P	RS1994	RES. 100Ω, 5%, 1/4W, C/F, T/R	2
R5P, R6P	RS1916	RES. C/F 5.1Ω 5% 1/4W T/ P	2
Transistors			
Q1	TR1135	TRANSISTOR PNP 2N5401	1
Q2	TR1108	TRANSISTOR 2SC2412 SMD NPN	1
Q4	TR1134	TRANSISTOR 2N5551 NPN	1
Q5	TR1167	TRANSISTOR 2N5551 NPN	1
Q6	TR1131	TRANSISTOR DTC114TK SMD NPN	1
Q7	TR1063	TRANSISTOR MPS2222A NPN	1
Q8	TR1166	TRANSISTOR PNP 2N5401	1
Q1P, Q1AP	TR1245	TRANSISTOR NPN TIP35E	2
Q2P, Q2AP	TR1246	TRANSISTOR PNP TIP36E	2
Q3P	TR1247	TRANSISTOR NPN TIP32E	1
Q4P	TR1248	TRANSISTOR PNP TIP31E	1

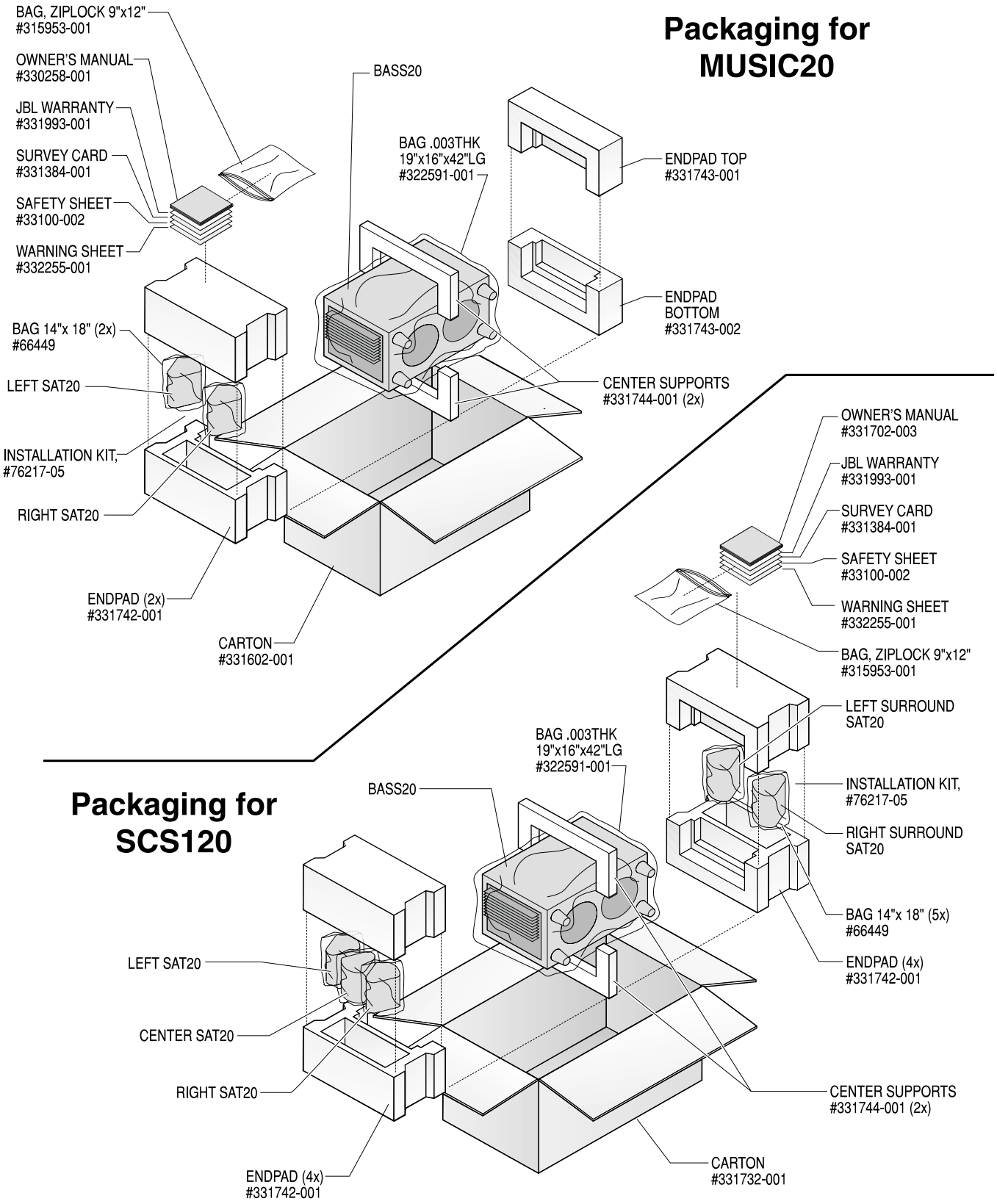
REF. NO.	PART NO.	DESCRIPTION	QTY
Miscellaneous			
L1	SA0000042	AIR CORE INDUCTOR 1.8uH MI	1
LED1	LE1032	LED BICOLOR RED/GREEN 5mm. PI	1
SW1	SW1070	SWCH SLIDE SP3T RIGHT AN PI	1
24	SW1075	SWITCH ROCKER 2P2T SNAP (230V ONLY)	1
TH1	TH1006	NTC THERMISTOR 10KΩ @25 P	1
TRIAC	TY1001	MAC224-4 TRIAC 200V 25A	1
XFORMR	MI1130	POWER TRANSFORMER (120V)	1
	MI1176	POWER TRANSFORMER (230V)	1

REVISIONS

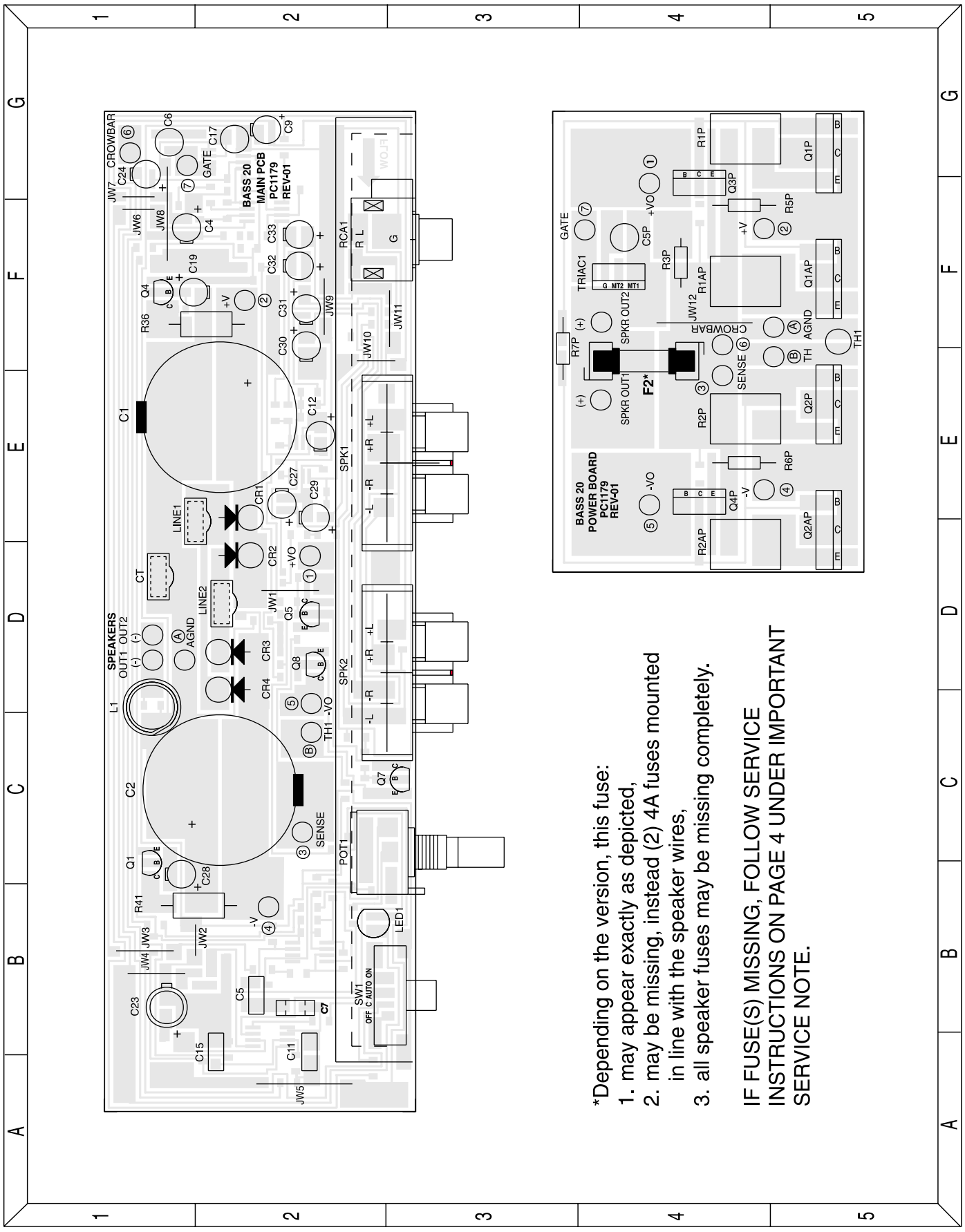
Date	Rev. No.	Changes Made
3/21/96	1	Increment And Transistor Voltage To 140v
6/19/96	2	R11 changed from 27K to 51K R12 changed from 51K to 24K R9 changed from 20K to 200K R10 changed from 33K to 200K R29 changed from 11K to 33K R51 changed from 160K to 470K R39 changed from 47K to 10K R54 changed from 47K to 10K R22 changed from 15K to 4.7K R34 changed from 15K to 4.7K R20 changed from 220 to 160 R40 changed from 220 to 160 R33 changed from 4.3K to 4.7K C5 changed from .1µF to .033µF C7 changed from .1µF to .033µF C11 changed from .1µF to .022µF C15 changed from .047µF to 3300ρF C21 changed from 100ρF to 330ρF Fuse changed from 3A to 5A C19 changed from 22µF/16V to 22µF/63V C28 changed from 22µF/16V to 22µF/63V R5P changed from 10 to 5.1 R6P changed from 10 to 5.1 C1 changed from 4700µF/50V to 4700µF/63V C2 changed from 4700µF/50V to 4700µF/63V

Date	Rev. No.	Changed Made
6/19/96	3	R was added from 100 -Dwg Rev.03 C was added from 0.1µF/100V -Dwg Rev.03 CX, CY added from 470ρF - Dwg Rev.03
6/24/96	4	PC1132-1 was changed to PC1132-2 Q1AP was added R1AP, R2AP were added from 0.1ohm Q2AP was added R2P was added from 100 C4P was added from 0.1µF/100V CX, CY were changed from 470ρF to C2P, C3P DIP, D2P were deleted
7/290/96	5	R20 changed from 220 to 160 R40 changed from 220 to 160 R5P changed from 10 to 5.1 R6P changed from 10 to 5.1
7/29/96	4	R29 was deleted from 33K R9 was deleted from 200K R51 was deleted from 470K R10 was deleted from 200K C7 was deleted from 0.033µF 10% R29 was added from 33.2K 1% R9 was added from 200K 1% R51 was added from 475K 1% R10 was added from 200K 1% C7 was added from 0.033µF 5%

BASS20 PACKAGING VIEW (MUSIC20 & SCS120)



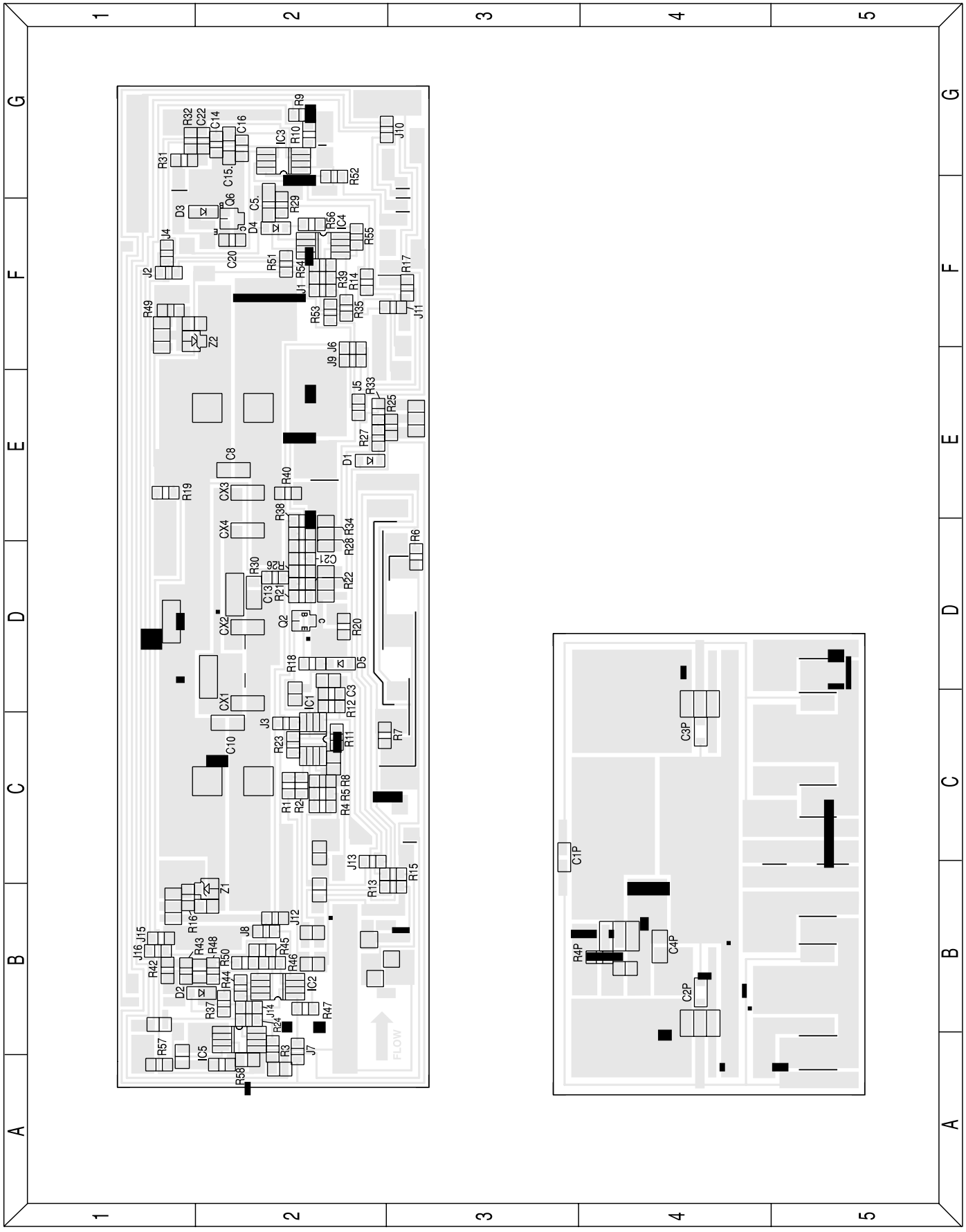
PRINTED CIRCUIT BOARDS (TOP VIEW)



*Depending on the version, this fuse:
1. may appear exactly as depicted,
2. may be missing, instead (2) 4A fuses mounted in line with the speaker wires,
3. all speaker fuses may be missing completely.

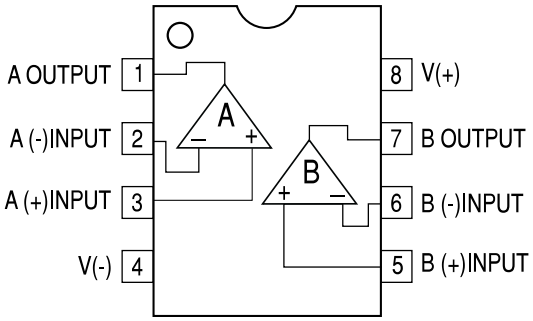
IF FUSE(S) MISSING, FOLLOW SERVICE INSTRUCTIONS ON PAGE 4 UNDER IMPORTANT SERVICE NOTE.

PRINTED CIRCUIT BOARDS (BOTTOM VIEW)

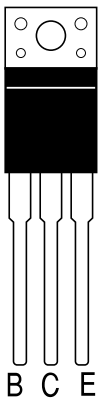


INTEGRATED CIRCUIT DIAGRAM

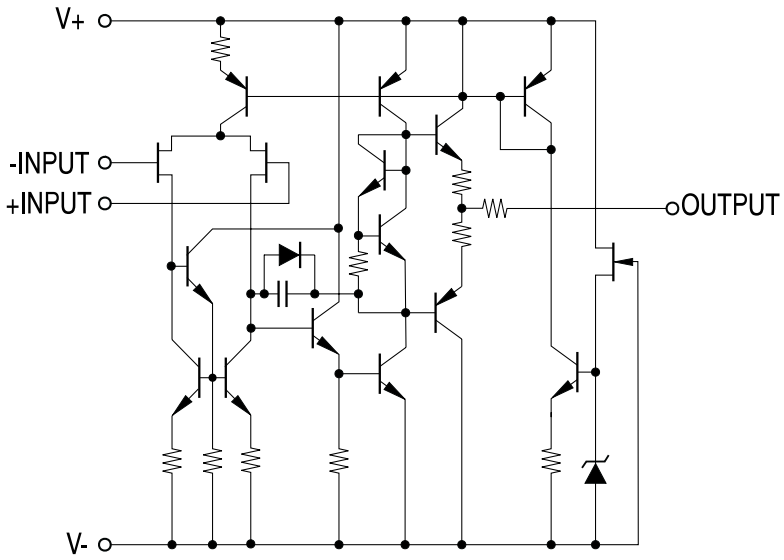
IC1, 2, 3, 4, 5 - NJM072B OP AMP
Connection Diagram



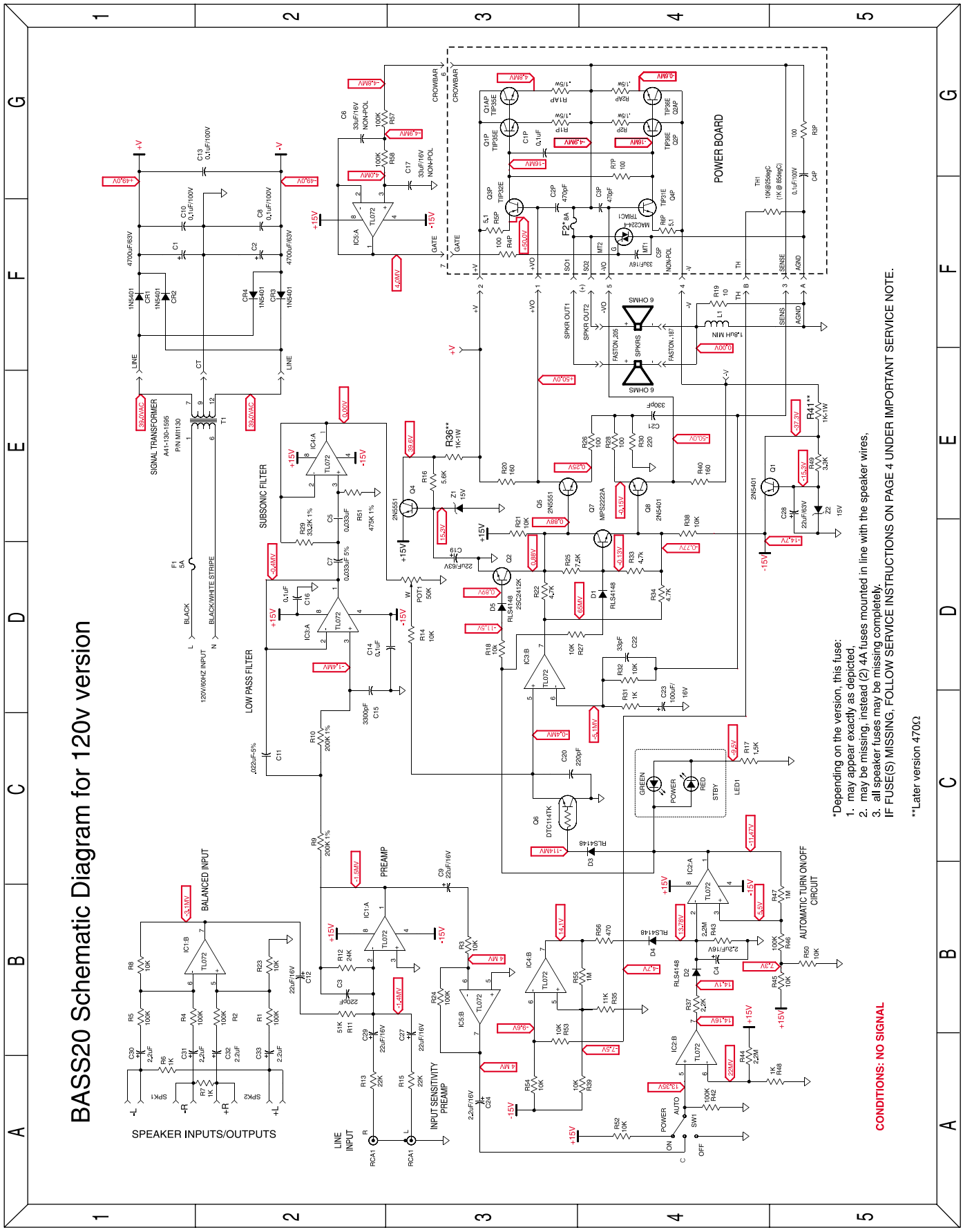
Q1P - TIP 35E
Q2P - TIP 36E
Q3P - TIP 32E
Q4P - TIP 31E



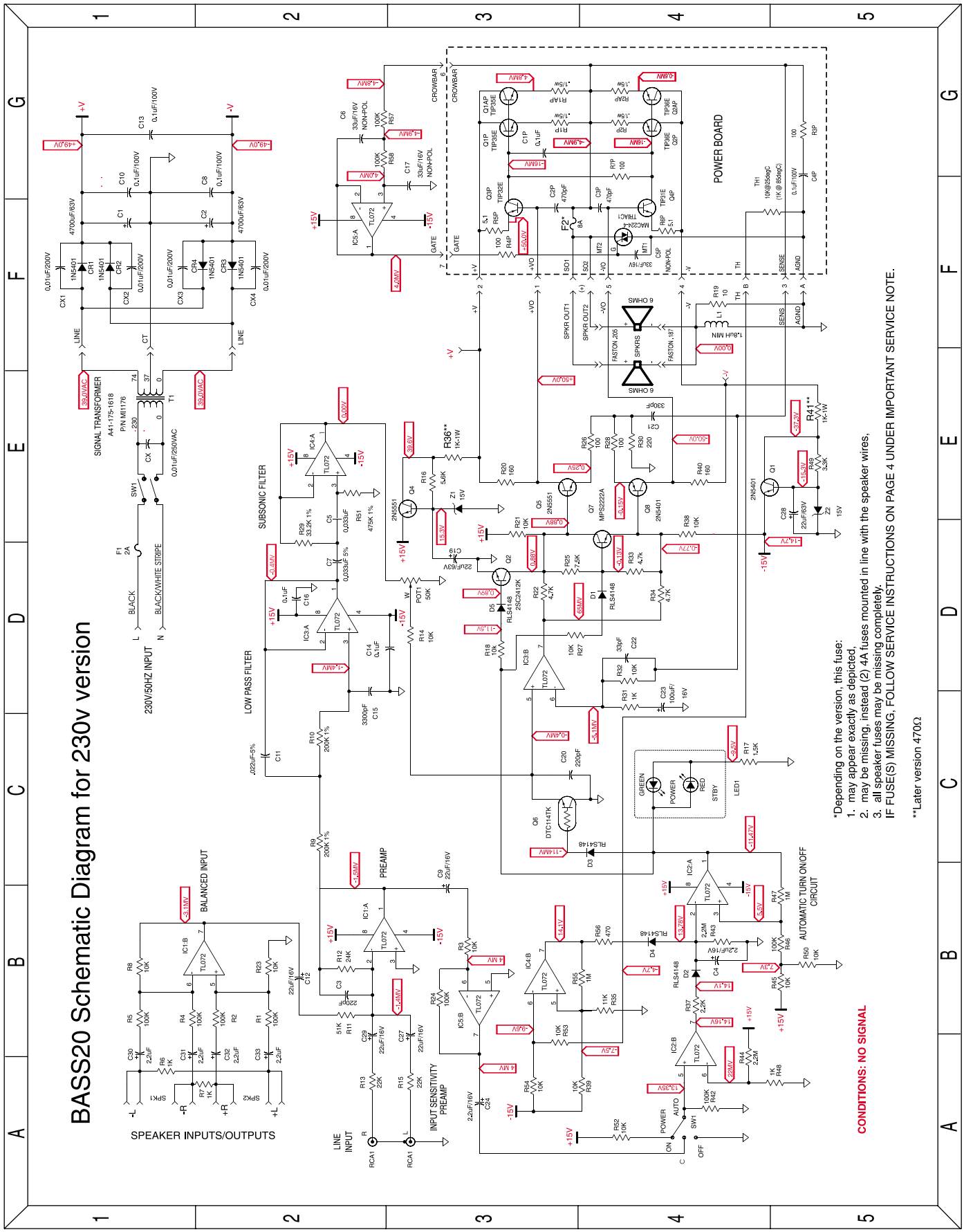
IC1, 2, 3, 4, 5 - NJM072B OP AMP (1/2 SHOWN)
Equivalent Circuit



120V SCHEMATIC DIAGRAM



230V SCHEMATIC DIAGRAM



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1. may appear exactly as depicted,
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IF FUSE(S) MISSING, FOLLOW SERVICE INSTRUCTIONS ON PAGE 4 UNDER IMPORTANT SERVICE NOTE.

**Later version 470Ω